IMGD 5100: Immersive HCI

Wayfinding

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Navigation

- Navigation = Travel + Wayfinding
- Travel is the component of VR that involves moving from one place to another
- Wayfinding is:
  - Knowing where you are,
  - Knowing where your destination is, and
  - Having some knowledge of how to get there.
Wayfinding in the Real World

How do we do wayfinding in the real world?
Why Study Wayfinding?

- Two reasons for wayfinding improvement in VR
  - VR performance enhancement
  - Training transfer

- We can show that:
  - One set of wayfinding cues works better than another
  - Exposure to wayfinding cues in VR improves wayfinding in the real world.

- Spatial Comprehension:
  - The ability to perceive, understand, remember, and recall for future use.
Spatial Knowledge Acquisition

- Direct environmental exposure
- Indirect tools, like maps
  - These can be used outside or inside the environment
- Direct cues (urban situations)
  - **Landmarks**
  - **Routes** (or paths) between landmarks
  - **Nodes** are junctions in routes
  - **Districts** are regions of the city
  - **Edges** prevent or deter travel
    - Typical edge is a river or lake
  - Landmarks and nodes typically live in districts, and routes pass through districts and connect them
Spatial Knowledge Acquisition Using Maps

- Can be used prior to travel
  - Used to plan ahead
  - Should be "North Up"

- Can be used during travel
  - Require a ego-to-geo transformation
  - Where am I? Which direction am I facing?
  - This must be updated during travel
  - Should be "Forward Up"

- The key to map use for navigation is resolving the egocentric to geocentric perspective transformation.
Spatial Acquisition

- Landmark, Route, Survey (or LRS) model described by Seigel & White, and Thorndyke & Goldin
  - Landmarks are acquired
  - Route knowledge is added to go between certain pairs of landmarks
  - Survey knowledge allows me to plan a route between any two landmarks

- The use of maps allows us to leapfrog directly to survey knowledge
  - But, this is inferior to real-world survey knowledge development
Strategies

- Looking for shoes in the mall
Map Examples: North Up
Map Examples:
Forward Up
Maps: North Up
Maps: Forward Up
Maps: Forward Up + Landmarks
Maps: Paths
Maps: Paths on the Map
Maps: Sun as Landmark
Landmarks

- Distinguishable (unique)
- Viewable from a good distance
- Memorable
Signage

☐ Can be:
  - World fixed
  - Body fixed
  - Object fixed
Signage

(http://www.FourWindsInteractive.com/)
Reference

- Much material from